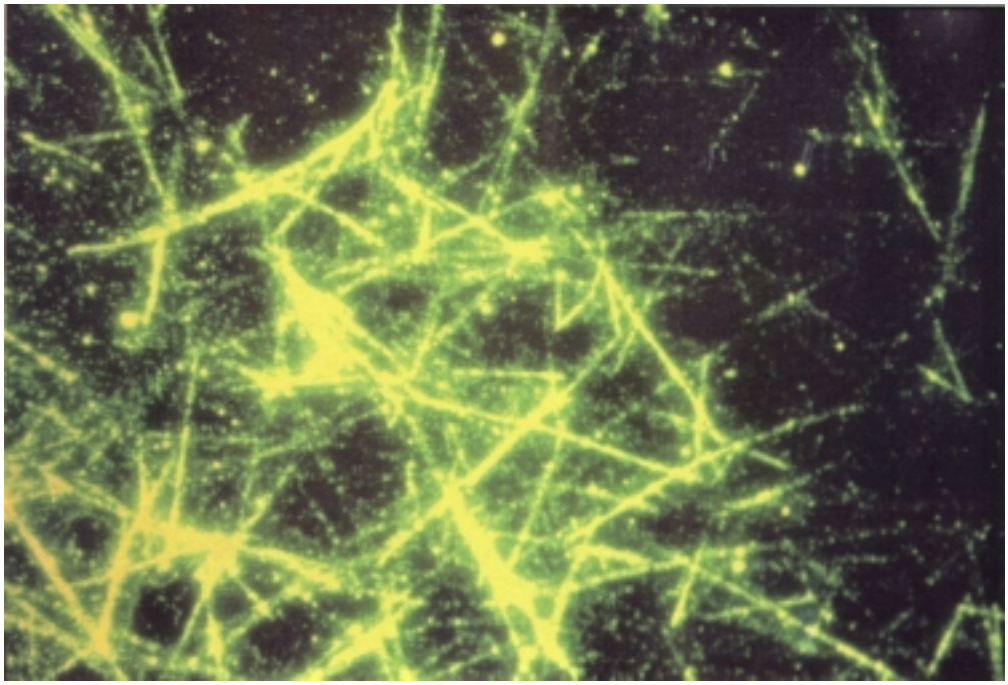
CONTROLLED RELEASE USING LIPID MICROCYLINDERS



Hollow microcylinders formed from photopolymerizable surfactants have been used for long-term release of biological response modifiers for soft tissue regeneration and for the release of antifouling agents in a ship-bottom paint formulation.

System advantages include the following:

- Long-term release from microcylinder lumen
- Biodegradability of lipid microcylinders in biological tissues
- Lipid microcylinders can be metallized for enhanced ruggedness
- Large scale processing methods developed amenable to labile protein incorporation
- Ease of handling and preparation

Lipid microcylinders self-assemble spontaneously from diacetylenic phospholipids under appropriate physicochemical conditions. The microcylinders are 50-500 microns in length and 0.5-1 micron in diameter, with walls that consist of helically wrapped layers of lipid. The microcylinders can be freeze-dried and reconstituted with the bioagent of choice. The microcylinders can also be reconstituted with polymer solutions to create microcylinder composites with modified release rates. Freeze-dried microcylinders can be stored for years in the dry state, with no change after reconstitution.

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